S&ME
ENGINEERING • TESTING

SHEET 10 OF 35
N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

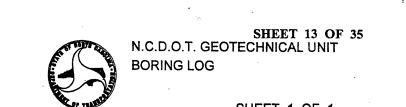
	ENC	JEEDIN	C . TEST	ING						SHEET 1 OF 1
			G • TEST	ices			:		- T.	
	CT NO.				1_		A1000			
			Replac						Mile	CICCK OIL TO
	G NO.					LOCATIO	N 16	+91		OFFSET 22 ILLI ALIGINALITY L
	R ELEV			NORTH					T	EASTING
	. DEPTH			DRILL		INE Di			DRII	ILL MICTHOD
	STARTE		5/04			COMPLE				SURFACE WATER DEPTH N/A
ORE	SIZE N	Q-2		Т БІ	JN	TOTAL F		0.8 ft ATA	L	DRILLER L. Shrader
LEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC.	RQD (ft)	SAMP. NO.	REC. (ft)	RQD (ft) %	Ö G	DESCRIPTION AND REMARKS
					}					481.4 Begin Coring @ 20.1 ft 2
481.4 480.8 476.1	20.1 20.7 25.4	0.6 4.7 5.0	1:20/0. 1:30/1. 1:30/1. 1:30/1. 1:20/1. 1:20/0. 1:30/1. 1:20/1.	0 67% 0 (4.7) 0 100% 0 (5.0) 0 100% 0	(4.2)		(20.6) 99%	(18.1) 87%		NON-CRYSTALLINE ROCK:  MEDIUM TO MODERATELY HARD  MODERATELY TO SLIGHTLY WEATHERED  GRAY-WHITE-GREEN METAVOLCANIC MUDSTONE  WITH MODERATELY CLOSE TO CLOSE FRACTURE SPACING  1 JOINT AT 5 DEGREES, 2 JOINTS AT 30 DEGREES,  1 JOINT AT 45 DEGREES, 1 JOINT AT 60 DEGREES,  7 JOINTS AT 80 DEGREES
471.1	30.4	4:5	1:20/1. 1:20/1. 1:30/1. 1:30/1.	0 0 (4.5) 0 100%	(3.7)					- 7 JOINTS AT 60 DEGREES
466.6	34.9	<u> </u>	1:40/1	ــــــا ٥.	1,,=	4			目	
		5.0	1:20/1 1:40/0 1:20/1 1:20/1	.5 100% .0	94%					
461.6 460.6		1.0	1:30/1	.0 (1.0)	(0.7 A 70%		<u> </u>	<u> </u>	耳	460.6
			1:20/1	<u></u>				a.c.		AT ELEVATION 460.6 FEET IN NON-CRYSTALLINE ROCK: MEDIUM TO MODERATELY HARD METAVOLCANIC MUDSTONE
	~									

SHEET 15 OF 35

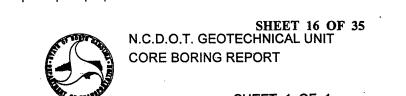
N.C.D.O.T. GEOTECHNICAL UNIT

JECT NO	INEERIN IRONAEN 3697		VICES	ID. NCMA10001B	COUNTY	' Unior		THE.	GEOLOGIST [	SHEET 1 OF 1
			cement	of Bridge No. 33 over Twelve Mile						GROUND WATER (ft)
RING NO.	B2-B		ВО	DRING LOCATION 17+46	OFFS	ET 6 ft	RT		ALIGNMENT -L-	0 HR. 3.4
LAR ELE	V. 494	.1 ft	NORT	THING	EAST					24 HR. N/M
AL DEPT	H 31.9	ft	DRILL	MACHINE CME-45B DRI	LL METH	IOD 23	4" HSA, Q-2 COF	NW CA	ASING ADVANCER, AND HAN	IMER TYPE AUTOMATIC
E START	<del></del>			COMPLETED 2/4/04	SURF	ACE W	ATER	DEF	PTH N/A	
/. DEPTH		OW COL		BLOWS PER FOOT 0 20 40 60 80	) 100	SAMP.	<b>V</b> /	0	SOIL AND ROO	CK DESCRIPTION
(ft)	0.5ft	0.5ft	0.5ft	0 20 40 60 80		NO.	/MOI	G		
				·						
1				GROUND SURFACE		-	<u> </u>	20,702.0	494.1 Al I	O. LUVIUM:
Ŧ			<u> </u>				w		SOFT G	RAY-BROWN SANDY SILT
5.2							<del>-</del>		NARTH TRACE OF	(A-4) BOULDERS, GRAVEL 5.
7,7	2	15	23	ф38 · · · · ·			W		- ANI	O WOOD
1	23	38	62/0.4	· · · · · · · · · · · · · · · · · · ·	····•		М	51	485.9 HARD GRAY	FINE SANDY SILT (A-4)
10.2	100/0.3				100/0.9		М		- 483.6 WITH TRACE OF	ROCK FRAGMENTS 10. ERED ROCK:
‡								〓	<ul> <li>(GRAY-TAN META)</li> </ul>	VOLCANIC MUDSTONE)
‡								国	MEDIUM TO M	ODERATELY HARD EVERE TO SLIGHTLY
‡								目	- 476.9 WEA	ATHERED 47.
+								目	WITH CLOSE TO V	ERY CLOSE FRACTURE
Ŧ										PACING J STALLINE ROCK: HODERATELY HARD
Ŧ									MODERATELY	TO VERY SLIGHTLY
Ŧ									<ul> <li>GRAY-WHITE MET.</li> </ul>	AVOLCANIC MUDSTONE TELY CLOSE TO VERY
Ŧ								目		CTURE SPACING
+								目		
‡		ļ	ļ			ļ	ļ	目	462.2	CASING ADVANCER
‡				BORING TERMINATED	-					GE DECK 24.0 FEET TO
‡				AT ELEVATION 462.2 FEET IN NON-CRYSTALLINE ROC	K:	1			2) ADVANCED NW	CASING ADVANCER TO WGROUND SURFACE.
Ŧ				MEDIUM TO MODERATELY H. GRAY-WHITE METAVOLCANIC MU					3) ADVANCED NQ- 10,5 TO 31.9 FEE	2 CORE BARREL FROM
Ŧ									4) CREEK WATER	USED AS DRILLING
Ŧ				\$7.					5) DRILLING FLUID APPROXIMATEL	
Ŧ									6) NO LOSS OF DR	
Ŧ									OBSERVED.	
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	ENG	INEERIN		TING VICES						THE REAL PROPERTY.	مر اللال			SHEET	1 OF 1
	ECT NO					NCMA10001B		UNTY					GEOLOGIST (		
			Repla	cement	of Bridge No	o. 33 over Twelve	e Mile Cre	ek on l	NC 16					GROU	ND WATER (f
BORI	NG NO.	B1-B		BC	ORING LOCA	ATION 16+91	0	OFFSE	T 22	ft RT		ALIG	NMENT -L-	0 HR.	N/M
COLL	AR ELE	<b>V.</b> 499	.8 ft	NORT	THING		I	EASTI	NG		-	·		24 HR.	0.9 on 2/10/0
TOTA	L DEPT	H 17.5	ft .	DRIL	MACHINE	Diedrich D-50	DRILL I	METH	OD 23	4" HSA	**********		HAN	MER TYPE	MANUAL
DATE	START	ED 2/	5/04		COM	PLETED 2/5/04	1	SURFA	ACE W	ATE	R DE	PTH N/			
ELEV.	DEPTH	BL	ow co	JNT		BLOWS PER FO		<del></del>	SAMP.	V/	1			<del></del>	·
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 20	40 60 1 1	80	100	NO.	МО	0 G		SOIL AND ROC	CK DESCRIP	TION
499.8 498.8						ROUND SURF	ACE					499.8			
493.8	Ī	3	3	2	• <b>6</b> 5 · · ·					w		• • • •	MEDI ORANGE-TAN	.UVIUM: UM STIFF I TO BROW! (A-4)	I SILT
491.3	8.5	2	3	4	• 67 • •	• • • • • • • •		::		М		. 491.8	•		
401.0	1 0.3	4	5	6	1					w		. 481.0		SIDUUM:	
486.3	13.5											 . 486,3	FINE S	GRAY-TAN ANDY SILT (A-4)	
482.3	T + 17.5	60/0.1					60/	0.1		M			NON-CRYS MEDIUM TO M GRAY-TAN METAN		'HARD
	‡	60/0.0					60/	0.0			一	482.3	1) ADVANCED 2-1/4	" HSA TO 17	.5 FEET
	T				STANDARD AT IN N MEDIU	RING TERMINATE PENETRATION 1 ELEVATION 482.3 ON-CRYSTALLIN IM TO MODERATI AVOLCANIC MUD	TEST REFU 3 FEET E ROCK: ELY HARD	JSAL							
-	<del>+ + + + + + + + + + + + + + + + + + + </del>			ı	_	r		•				-			. •
BOKE SINGLE 31-238.GPJ NODOL, GDI ZJIBON	+ + + + + + + + + + + + + + + + + + + +					•						-			



	ENGI	INEERIN RONMEI	NG • TES	TING ACES						SHEET 1 OF 1								
OJE	CT NO	. 369	71	······································		ID. NC	MA100	01B		COUNTY Union GEOLOGIST D. BENTS	). BENTS							
TE D	ESCRIF	TION	Repla	cement	of Brid	lge No. 3	3 over	Twelve	Mile	e Creek on NC 16 GROUND WATER (ft	t)							
RIN	G NO.	B2-B		во	RING	LOCATIO	ON 17	+46		OFFSET 6 ft RT ALIGNMENT -L- 0 HR. 3.4								
)LL/	R ELE	V. 494	.1 ft	NORT	HING					EASTING 24 HR. N/M								
TAL	. DEPTI	1 31.9	) ft	DRILL	MAC	HINE C	ME-45I	В	DRI	RILL METHOD 2X" HSA, NW CASING ADVANCER, AND HAMMER TYPE AUTOMATIC	5							
TE	STARTI	ED 2	/4/04			COMPLE	ETED :	2/4/04		SURFACE WATER DEPTH N/A								
RE	SIZE	IQ-2	<b></b>			TOTAL F				DRILLER J. Little								
EV. ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft	REC.	RQD (ft)%	SAMP. NO.	REC.	RQD (fi)	G G	DESCRIPTION AND REMARKS								
							<u> </u>			483.6 Begin Coring @ 10.5 ft	10.							
3.6 11.9 6.9	10.5 12.2 17.2	5.0	3:00/1. 2:30/0. 2:20/1. 2:00/1. 2:00/1. 2:10/1. 2:10/1.	7 88% 0 (5.0) 0 100% 0	(0.0) 0% (0.9) 18%		(6.5) 97% (14.7)	(0.9) 13% (12.2)		NON-CRYSTALLINE ROCK:  MEDIUM TO MODERATELY HARD  MODERATELY SEVERE TO SLIGHTLY WEATHERED  GRAY-WHITE METAVOLCANIC MUDSTONE  WITH CLOSE TO VERY CLOSE FRACTURE SPACING  4 JOINTS AT 5 DEGREES, 2 JOINTS AT 30 DEGREES,	<u>17</u> .:							
1.9	22.2		2:00/1. 2:00/1. 3:10/1. 2:40/1.	100%	62%		100%			4 JOINTS AT 45 DEGREES, 3 JOINTS AT 60 DEGREES, 1 9 JOINTS AT 80 DEGREES NON-CRYSTALLINE ROCK: MEDIUM TO MODERATELY HARD								
6.9	27.2	5.0	2:30/1. 2:00/1. 2:00/1. 2:00/1.	0 100% 0 0 0 0	(4.9) 98%					MODERATELY TO VERY SLIGHTLY WEATHERED GRAY-WHITE METAVOLCANIC MUDSTONE WITH MODERATELY CLOSE TO VERY CLOSE FRACTURE SPACING 5 JOINTS AT 5 DEGREES, 4 JOINTS AT 30 DEGREES,								
52.2	31.9	4.7	2:00/1. 2:10/1. 1:20/0. 2:20/1. 2:20/1.	<u>o</u> / (4.7) 7   100% 0	(4.2) 89%			. 4		4 JOINTS AT 45 DEGREES, 5 JOINTS AT 60 DEGREES, 4 JOINTS AT 80 DEGREES	31.							
			2:30/1.	<u>o</u> 1						BORING TERMINATED AT ELEVATION 462.2 FEET IN NON-CRYSTALLINE ROCK: MEDIUM TO MODERATELY HARD GRAY-WHITE METAVOLCANIC MUDSTONE								

SHEET 14 OF 35
N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET No. |SUB-3 PROJECT REFERENCE No.

	ESCRI			cement	ID. NCMA10001B C	OUNTY		)		GEOLOGIST D	SHEET 1 OF 1  BENTS  GROUND WATER (1)	F#1:
	IG NO.			<del></del>	ORING LOCATION 17+41		ET 22	R LT		ALIGNMENT -L-	0 HR. 12.8	ıı
OLLA	R ELE	V. 499.	3 ft	NORT		EAST					24 HR. 5.8 on 2/10/0	14
OTAL	. DEPTI	1 19.2	ft	DRILL	MACHINE Diedrich D-50 DRIL	L METH	IOD <sup>23</sup>	4" HSA		HAM	MER TYPE MANUAL	
	STARTI			l	COMPLETED 2/5/04	7		ATER	DE	PTH N/A	MERCHIE MANORE	
ELEV.	DEPTH	BLO	OW COL	JNT	BLOWS PER FOOT		SAMP.		L			
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 20 40 60 80	100	•	MOI	0 G	SOIL AND ROC	K DESCRIPTION	
										· · · · · · · · · · · · · · · · · · ·		
					ODOLIND OLIDEA OF							
499.3	,				GROUND SURFACE				888	499.3 ALL	UVIUM:	0.0
495.8	3.5									SOFT ORANGE-TA	AN TO GRAY-BROWN ANDY SILT	
-	-	2	1	2	1:4:3::::::::::::::::::::::::::::::::::			M		- (	A-4) BOULDERS, GRAVEL,	
-	F						·			WOOD AND O	RGANIC MATTER	
490.8	8.5	1	1	17				w		- - 489.8		9.5
. ]	E	•		"	0.18			**		- RES	IDUUM:	9.;
485.8	13.5							又		- FINE SA	HARD GRAY-TAN ANDY SILT	
**	-	20	35	40	75			М		<ul> <li>WITH TRACE OF</li> </ul>	A-4) ROCK FRAGMENTS	
483.3	16.0	60/0.0				60/0.0				- 483.3 - NON-CRYS	TALLINE ROCK:	16.0
480.8	18.5	-60/0.0-			1	60/0.0					ODERATELY HARD OLCANIC MUDSTONE	19.2
3		00/0.0			BORING TERMINATED				П	1) ADVANCED 2-1/4'		
,	F				BY AUGER REFUSAL					- , -		
-	F				AT ELEVATION 480.1 FEET IN NON-CRYSTALLINE ROCK					<del>-</del> <del></del>		
4	-				MEDIUM TO MODERATELY HAI METAVOLCANIC MUDSTONE					• •		
4	-					• •				<u>-</u>		
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SHEET 19 OF 35

	S ENGII ENVIR	8. NEERIN ONMEN	G • TEST	TING VICES								THE STATE OF	THE	N.C.D.O.T. G BORING LO	SEOTECHNIC		35
ROJE	CT NO.					ID.	NCMA10	001B	C	OUNTY	Union			GEOLOGI	ST D. BENTS	1 01 1	_
TE D	ESCRIP	TION	Replac	cement	of E	Bridge No								10202001		ID WATER (f	
	G NO.					NG LOCA				OFFSI		RIT		ALIGNMENT -L-	0 HR.	N/A	7 J .
	R ELEV		5 ft	NORT						EAST					24 HR.	5.8 on 2/10/0	<u>ا</u> ه
	DEPTH					ACHINE	Diedric	h D-50	DRILI	METH		4" HSA	AND N	IQ-2 CORE BARREL	HAMMER TYPE		-
ATE:	STARTE	D 2/9	9/04	L			PLETED					ATER	DE	PTH N/A			
EV.	DEPTH	BLO	ow cou	JNT			<del></del>	PER FOO	T	ــــــــــــــــــــــــــــــــــــــ	SAMP.	<b>V</b> /	L				
(ft)	(ft)	0.5ft	0.5ft	0.5ft	o	20	40	60	8,0	100		MOI	0 G	SOIL AND	ROCK DESCRIPT	ION	1 7
98.5 97.5	- 1.0 -	1	1	1	1	(	GROUNE	SURFA	CE			м		498.5 SOFT ORA	ALLUVIUM: NGE-TAN TO DAR	K GRAY	0.0
95.0	3.5	1	2	1		)3						w		F WITH TRA	INE SANDY SILT (A-4) ACE OF GRAVEL, F ORGANIC MATTE	ROOTS	
36.2	8.5 - - 12.3	1 60/0.0	2	100/0.4	: <b> </b>   :		· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		00/0.4		w	7.7	- 486.2 (GRAY-TAN N	ATHERED ROCK: METAVOLCANIC MI CRYSTALLINE ROO		9.5 12.3
		80/0.0								80/0.0		-		MEDIUM MODERA' GRAY-WHITE WITH MODE CLOSE	TO MODERATELY TELY TO VERY SLI WEATHERED METAVOLCANIC N ERATELY CLOSE FRACTURE SPAC	HARD GHTLY MUDSTONE TO VERY HING	36.2
			•			AT IN N MEDII	BORING 1 ELEVATI ION-CRYS UM TO MO TAVOLCA	ON 462.3 STALLINE ODERATE	FEET ROCK: LY HAF	RD				2) SET 12.3 FE 3) ADVANCED 12.3 TO 36. 4) CREEK WA FLUID. 5) APPROXIM DENSITY 6.	EET OF NW CASIN 1 NQ-2 CORE BARF 2 FEET. TER USED AS DRI ATE DRILLING FLU 2.4 PCF. 1F DRILLING FLUID	G. REL FROM LLING JID	±